The leadership role of the teacher librarian in technology integration: Early results of a survey of highly certified teacher librarians in the United States

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Abstract

In 2008, the United States' Institute for Museum and Library Services funded Project Leadership-in-Action (LIA) that included surveys of the technology integration practices of teacher librarian leaders with National Board Certification. Preliminary 2009 survey results suggested that the 295 respondents worked in well-resourced libraries with personnel assistance as well as numerous computers and devices. Respondents reported that they led school technology integration in many areas but also had areas in which to improve such as services to special needs learners, participation in student assessment, and transferring their leadership success to professional and local communities.

Introduction

Technology integration is an increasingly crucial element of teaching and learning that requires school-based leadership in order to be consistent, relevant, and a connector between various aspects of students' learning experiences. Many theorists and researchers have argued that teacher librarians are well positioned to assume a leadership role in technology integration (e.g., Everhart & Dresang, 2006; Hughes-Hassell & Hanson-Baldauf, 2008; McCracken, 2001; Shannon, 2002; Vansickle, 2000). Teacher librarians have been continually directed to assume leadership roles in their schools in the professional guidelines of state, national, and international organizations although research-based strategies to successfully exercise technology integration leadership have yet to be developed.

A starting point to defining these strategies is to determine the current technology leadership through today's school libraries. The study presented here provides this initial attempt to characterize current teacher librarians' technology integration activities in the contexts of what teacher librarians know, do, and how they grow as professionals. This study reports the results of a survey of National Board Certified (NBC) teacher librarians who have already been deemed leaders in their schools and profession.

Literature Review

The ever-changing and highly technological environment of 21st century schools has significantly impacted and redefined the role of the teacher librarian. Information literacy is not a new concept, but with the advances in online and digital resources, information literacy has evolved into other forms of literacies, moved to the forefront in education, and presents the opportunity for teacher librarians to assume leadership roles within their schools through technology integration (Asselin, 2005; Hanson-Baldauf & Hughes-Hassell, 2009; Hughes-Hassell & Hanson-Baldauf, 2008). Yet, teacher librarians have had difficulty enacting this leadership role in technology integration (McCracken, 2001).

This evolution of the role of the teacher librarian is present in the standards and guidelines that define and guide practice for teacher librarians. The guidelines from the American Association of School Librarians

(AASL) (2009), the National Council of Accreditation of Teacher Education (NCATE) (2003), and the National Board of Professional Teaching Standards (NBPTS) (2001), all mention the role of leadership, especially in the area of technology integration, when defining the responsibilities of the teacher librarian. Most recently in 2009, AASL released new guidelines for school library programs that reiterate the belief that the teacher librarians should act as a leader within their school community to ensure that learners are equipped with the skills and knowledge they need to succeed in the technological society of the 21st century. Teacher librarians are charged, "to play a leading role in weaving such skills throughout the curriculum so that all members of the school community are effective users of ideas and information" (American Association of School Librarians [AASL], 2009, p. 49). It is this "weaving" or the integration of technology into the curricular areas where the teacher librarian based on their knowledge of pedagogical principles, their global perspective on the school curriculum, their training as information experts, and their experience in forging cooperative partnerships with classroom teachers can serve as a leader and valuable asset to their schools (Asselin, 2005; Vansickle, 2000). The U.S. Department of Education's National Center for Education Statistics (NCES) defines technology integration as: "the incorporation of technology resources and technology-based practices into the daily routines, work, and management of schools…. it is important that integration be routine, seamless, and both efficient and effective in supporting school goals and purposes" (Forum on Education Statistics of the National Center for Education Statistics [NCES], 2002, 3). The key to technology integration in education is that technology is used to enhance the learning experience and develop learners' thinking skills and not as an add-on or afterthought (Hew & Brush, 2007).

Yet, teachers, even in schools and districts committed to technology integration, still struggle with effectively integrating technology and teaching practice remains largely unchanged (Consortium for School Networking [CoSN], 2004; Cuban, Kirkpatrick, & Peck, 2001). Teacher librarians should lead through modelling and partnering with teachers to guide instructional design and offer expertise on the integration of emergent technologies to create engaging and relevant learning experiences for students (AASL, 2009; Asselin, 2005). This changing information landscape of the 21st century, that includes interactive technologies and a participatory culture, requires that the teacher librarian must evolve as a leader to address the needs of this new generation of learners. Despite the demands for teacher librarians to accept these technology leadership roles that have become mandatory in this age of information and digital resources (Asselin, 2005), there is an extreme lack of research-based strategies for the enactment of this role for teacher librarians.

The research in this area also supports the contention that teacher librarians must embrace their leadership role in technology integration. A compilation of recent state studies results (Scholastic, 2008) examined the teacher librarian and the impact on student achievement and identifies two roles of the teacher librarian that impact student achievement: leader and technology facilitator. In those studies, teacher librarians who exhibited leadership were more likely to plan cooperatively with teachers, teach cooperatively with teachers, provide training for teachers, and take responsibility for technology integration (e.g., Lance, Rodney, & Hamilton-Pennell, 2000). Most importantly noted was the connection between leadership and collaboration, in that classroom teachers were more willing to collaborate with the teacher librarian if she or he had taken the initiative to become an assertive, involved leader in the school (e.g., Rodney, Lance, & Hamilton-Pennell, 2002).

School libraries provide opportunities for students to access and utilize a variety of information resources. As educators it is the responsibility of teacher librarians to prepare students for their future and "develop information skills that will enable them to use technology as an important tool for learning, both now and in the future" (AASL, 2007, p.2). Information literacies or "the ability to find, evaluate, analyse, and synthesize information" (Smolin & Lawless, 2003, p. 571) have evolved to the "new literacies" and go beyond simply knowing how to use technology tools to also include understanding how to apply them in learning (Asselin, 2005; Smolin & Lawless, 2003; Greenhow, Robelia, & Hughes, 2009; Kuiper, et al., 2005) as well as to create and communicate new learning (AASL, 2007; Partnership for 21st Century Skills [P21], 2009). Students need to be taught the skills they need to create, invent, design, and expand their world by actively participating in this new digital culture, but also to develop these new literacies to guide them in ethical, legal, and safe participation (Greenhow, Robelia, & Hughes, 2009; Livingstone, 2008; Nelson, Christopher,

& Mims, 2009; Todd, 2008). Technology and information literacies are vital for success in this information-laden world and due to the "interdisciplinary, collaborative, and information-rich nature of school librarianship, [teacher] librarians are in a prime position to make significant and meaningful contributions toward the integration of 21st century literacy skills" (Hanson-Baldauf & Hughes-Hassell, 2009, p. 4). This will require active participation and acceptance of leadership roles through building relationships with all school community stakeholders.

In numerous studies (Scholastic, 2008), the connection is made to an understanding of the roles of the teacher librarian by the principals and teachers. Unfortunately it has been found that an extremely limited number of principals even recognized that teacher librarians should take on a leadership role (Hartzell, 2002; Oberg, Hay, & Henri, 2000; Smith, 2006). The importance of the principal and the influence this person has on the teacher librarian's ability to assume leadership roles is critical in the area of technology integration. Research has found that a school's technology planning, leadership, professional development, curriculum alignment, technology use, and perceptions of technology's effect on learning could all be attributed to school administrators' opinions (Anderson & Dexter, 2005; Kowch, 2009; Owen & Demb, 2004). Despite the abundance of literature that has suggested the need for and the importance of the teacher librarian to be a proactive leader in schools, this role is one that has been ignored in the research arena and left undefined for school administrators, teachers, and the teacher librarians themselves (Asselin, 2005; Everhart & Dresang, 2006; Shannon, 2008). This lack of clarity was extremely apparent in the research examining the preparation programs for future teacher librarians and the lack of training and preparation for understanding or accepting the leadership role (Asselin, 2005; Everhart & Dresang, 2006; Shannon, 2002, 2008; Vansickle, 2000)

The importance of these roles was confirmed by several national organizations, including the American Association of School Librarians (AASL) the NBPTS, the International Society for Technology in Education (ISTE), the Association for Education Communications and Technology (AECT), the National Council for the Accreditation of Teacher Education (NCATE), as well as state school media organizations. The primary goal of the 2005 AASL Strategic Plan was to achieve universal recognition of teacher librarians as indispensable educational leaders. Similarly, leadership was a unifying theme in AASL's national guidelines for professional practice, *Information Power* (1998). *Information Power* also emphasized technology integration as an important aspect of the school library media program. In 2007, AASL released the *Standards for the 21st Century Learner* and stated in the standards as one of nine common beliefs that "Technology skills are crucial for future employment needs. Today's students need to develop information skills that will enable them to use technology as an important tool for learning, both now and in the future." (AASL, 2007, p.2).

The ever-changing and highly technological environment of 21st century schools has significantly impacted and redefined the role of the school librarian by presenting the opportunity to assume a leadership role through technology integration. Despite the demands and opportunities for teacher librarians to accept these critical technology leadership roles, there is a lack of a theoretical foundation and research-based strategies for the enactment of this role for school librarians. The review of the research illustrates a void that needs to be filled in order to successfully prepare future teacher librarians for a leadership role in the integration of technology.

Methodology
Research on technology integration in schools and roles of teacher librarians provides an impetus to study the leadership role of teacher librarians in technology integration. This research is framed a particular leadership perspective, as described in this section.

Theoretical framework
Formative Leadership Theory was used as the methodology for framing the research problem and research questions, the development of the survey instrument, and the analysis of results. Developed by Ash and Persall (2000), Formative Leadership Theory is based on the belief that there are numerous leadership possibilities and many leaders within the school. Leadership is not role-specific, reserved only for administrators; rather, the job of the school leader is to facilitate learning opportunities for the faculty and

staff in order that they might develop into productive leaders. This theory of leadership supports the view of the teacher-librarian as leader. It is grounded in the belief that educators should enhance not only student learning but also the learning of the adults within the school.

The formative leader must possess a high level of facilitation skills because team inquiry and learning and collaborative problem solving are essential ingredients of this leadership approach. Imagining future possibilities; examining shared beliefs; asking questions; collecting, analysing, and interpreting data; and engaging the faculty in meaningful conversation about teaching and learning are all formative leadership behaviours. It in order to determine the leadership role of teacher librarians in technology integration, this theory was guided the research presented here.

In light of the research problem identified in the literature review and the possibilities for leadership outlined in Formative Leadership Theory, this study sought to answer the research question, "What is the leadership role of the teacher librarian in technology integration?"

Procedure
A research team consisting of two professors, two doctoral students, and a statistical consultant developed, administered, and analysed a nationwide survey, which characterized the dominant technology integration activities of teacher librarian leaders.

Description of the sample
Participants in this study are National Board Certified (NBC) teacher librarians. National Board Certification is the highest credential in the teaching profession and less than 2% of teacher librarians in the U.S. are NBC. This sample was chosen for two reasons. One is that documented accomplishments in technology integration and leadership form the basis of two of the four required portfolio entries for the rigorous NBC credential in Library Media. The other is that a vast body of research exists concerning how NBC develops leaders (National Board for Professional Teaching Standards [NBPTS], 2010) but this research is exclusively based on teachers. Hence, this sample is uniquely positioned to both define and differentiate leadership roles in technology integration for teacher-librarians.

After obtaining appropriate Institutional Review Board approval, respondents were solicited by sending invitations to NBC teacher librarians whose email addresses could be ascertained from information available on the NBPTS organizational website. This is approximately 35% of the population of 2100 NBC teacher librarians in the United States. Participants were also obtained via postings on the following email lists: Yahoo! Groups/Library Media (for teacher-librarians seeking National Board Certification), LM_NET, aaslforum, and many state teacher-librarian email lists.

From these respondents, a stratified random sample of 295 cases representing elementary, middle, and high schools was constructed. While respondent names were not included in the results, respondents' U.S. Department of Education-assigned school identification codes were used as unique identifiers to ensure unique cases.

Data collection
Because there is a lack of recognition of the role of the media specialist as a leader in technology integration, no satisfactory data instruments existed that could define and measure this role. Members of the research team developed a survey instrument for this purpose based on national standards that included:

1. *Empowering Learners: Guidelines for school library media programs* (AASL, 2009);
2. The International Society for Technology in Education (ISTE) *National Educational Technology Standards (NETS•T) and Performance indicators for teachers* (ISTE, 2008);
3. *Library media* standards (NBPTS, 2001)
4. *Standards for initial preparation programs: School library media specialists* (AASL & NCATE, 2003).

In order to ensure that the survey accurately and rigorously reflected the phenomenon being studied, it was pre-tested with both an advisory board composed of experts in the field of library media and technology and a group of NBC teacher-librarians. Several revisions were incorporated based on these results. The final version survey, reported here, consisted of three sections, including:

1. 30 demographic questions covering areas such as staffing levels, education and experience of the teacher-librarian, and Internet access;
2. 60 statements related to technology integration activities; and
3. Free response questions that asked respondents to discuss 1) barriers, 2) enablers, and 3) other factors that influenced their leadership practices.

Table 1 details the sections in which the 60 statements related to technology integration activities were organized. These headings reflect the sections of the NBPTS *Library media* standards (2001).

Table 1. Survey statement sections.
What Library Media Specialists Know
I.   Knowledge of Learners
II.   Knowledge of Teaching and Learning
III.   Knowledge of Library and Information Studies

What Library Media Specialists Do
IV.   Integrating Instruction
V.   Leading Innovation through the Library Media Program
VI.   Administering the Library Media Program

How Library Media Specialists Grow as Professionals
VII.   Reflective Practice
VIII.   Professional Growth
IX.   Ethics, Equity, and Diversity
X.   Leadership, Advocacy, and Community Partnerships

Response choices for statements related to technology integration activities reflected respondents' degree of leadership regarding the particular integration activity: 0=Not My job; 1=Rarely involved; 2=Partially involved; 3=Substantially involved; 4=Fully involved. Each of these response choices was fully explicated in the context of the survey instrument (for the purposes of this study, the term "library media specialist" is a term synonymous with "teacher librarian"). The survey statements reported in this paper are featured in the Appendix.

A consulting group managed the web-based survey distribution. Subjects were also mailed a paper copy to assure contact to account for any emails that may have been blocked by network firewalls - a common practice in U.S. schools. As an incentive, survey participants were given the opportunity to enter a drawing for a $100 gift certificate to Amazon.com.

Data analysis
Survey data was analysed in order to determine the most prevalent leadership roles of teacher librarians in technology integration. The Statistical Package for the Social Sciences (SPSS), was used for quantitative analysis, including the frequencies presented here. Preliminary results of the survey were reviewed with the aforementioned national advisory board.

This research report will includes frequency analyses of demographic data and statements relating to technology integration activity; it does not include results of the open-ended questions pertaining to barriers, enablers, and additional feedback.

Limitations
This research has limitations. First, since not all NBC teacher librarians could be contacted directly, it may not be possible to assume that the sample is truly random or truly stratified. Second, by definition, NBC teacher librarians represent a small minority (about 2%) of all teacher librarians in the U.S. Because the process of NBC is very rigorous, it is expected that this group would perform at a higher level than the norm.

Results
The initial survey questions prompted participants to provide information about themselves, their professional preparation, prior experience, and their work and technology environments.
Respondent demographics mirror the general population of teacher librarians (Kenney, 2009). On average, the participants were White middle-aged women about 50 years old. Seventy one percent (n=210) formerly were classroom teachers. The majority of those who once taught in elementary schools (n=80) worked in the upper grades (n=45) and of those who reported having been teachers in middle and high schools (n=131), 14% taught language arts (n=41), 8% taught history (n=22), and 5% reading (n=15).

In the U.S., each state has its own certification requirements, which can make it difficult to change jobs from state to state. 16.9% (n=50) of the respondents did not currently work in the same state where they received NBC, suggesting that NBC is a nationally recognized teaching credential.

These NBC teacher librarians have above average work environments when compared to recent statistics collected by the U.S. Department of Education (Goldring, 2009). Almost all (n=291 or 98.7%) worked full-time in one school and nearly 75% (n=221) had full-time paid support staff. Only 13% (n=39) had a fixed schedule.

With very few participants reported full time (n=123 or 42%) or part time (n=45 or 15%) technology support staff, the technology available in these school libraries was above national averages (Goldring, 2009); the mean number of desktop computers was 165 and mean number of laptop computers was 52. Almost (n=290 or 98%) all of the Internet access is through filtered broadband. Only 7% (n=21) of the teacher librarians in this study disabled filters for students, and about twice as willing (n=38 or 13%) for teachers despite federal mandates that require filter disabling for legitimate educational applications (Willard, 2003).

Section I. What library media specialists know: Knowledge of learners
Questions in this section captured participants' "knowledge of learning styles and of human growth and development" (NBPTS, 2001, p.7) and using that knowledge to meet a range of learners' needs.

Respondents overwhelmingly answered that they were fully or substantially involved in providing (n=241 or 82%), instructing (n=235 or 80%), and impacting (n=210 or 71%) learning activities. The final question in the section, "I provide assistive and adaptive technologies for learners" had the lowest number of survey respondents fully or substantially participating in this activity (n=103 or 35%) as illustrated in Figure 1.
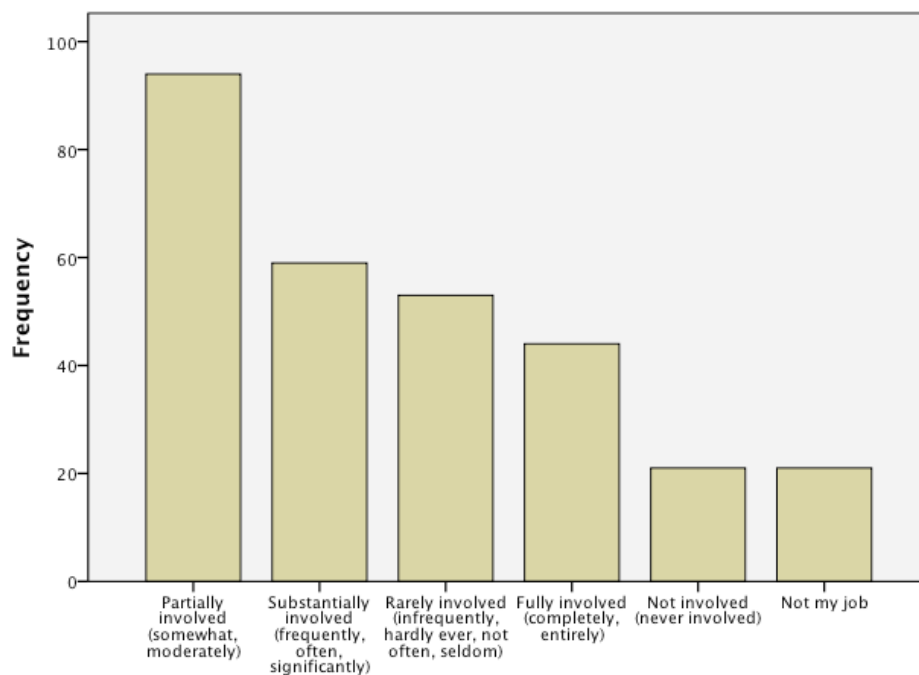
Figure 1. Survey participant responses to "I provide assistive and adaptive technologies for learners" (N=292).

Section II. What library media specialists know: Knowledge of teaching and learning
Questions in this survey section focused on "the principles of teaching and learning that contribute to an active learning environment " (NBPTS, 2001, p.11) and asked respondents to rate the extent to which they applied their knowledge of learning theory and instructional design and development as well as their abilities to establish an active and positive learning environment; develop group-management strategies; and strengthen and supporting school, district, and state curricula.

Respondents reported that they fully or substantially used technology to pique learners' interest (n=281 or 95%); align to professional and technology standards (n=273 or 93%); differentiate instruction (n=255 or 87%); and model the use of technology (n=233 or 79%). Most respondents also were substantially or fully involved in teaching learners to identify the appropriate technology for their needs (n=243 or 82%).

Section III. What library media specialists know: Knowledge of library and information studies
This survey section includes questions pertaining to "the principles of library and information studies needed to create effective, integrated library media programs" (NBPTS, 2001, p.15). Questions reflected knowledge of the principles of the profession; ethical and legal tenets; effective organization and practice; children's, teen, and professional literature; information-processing strategies; and technology for the creation and management of information.

A large majority respondents reported being fully or substantially involved in collaborating with teachers to use technology in their instruction (n=219 or 74%); providing teachers with access to technology that enhances their instruction (n=235 or 80%); promoting learning activities that connect technology to content standards (n=227 or 77%); advocating for the use of technology for alternative demonstrations of student learning (n=219 or 73%). Most respondents were also fully or substantially involved in helping learners to create their products using various technology (n=215 or 72%) and facilitating learners' use of technology to express new ideas (n=207 or 70%).

However, few respondents were fully or substantially involved in the initial process of setting learning objectives and promoting the integration of technology in classroom instruction (n=122 or 41%) and,

as Figure 2 depicts, many fewer respondents fully or substantially provided teachers with technological alternatives for assessing student learning (n=113 or 38%).
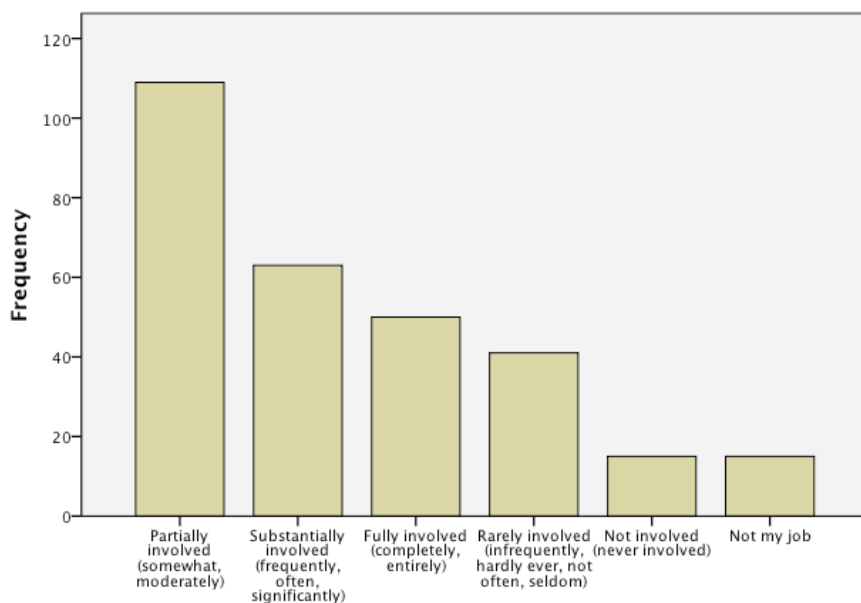

Figure 2. Participants' responses to "I provide teachers with a range of technological alternatives for assessing students' learning" (N=293).

Section IV. What library media specialists do: Integrating instruction
The NBPTS standards (2001) state that "[a]ccomplished library media specialists integrate information literacy through collaboration, planning, implementation, and assessment of learning" (p.19). This section contained questions pertaining to collaboration in planning learning; implementing instructional activities; and assessing learning and instruction.

The majority of respondents were fully or substantially involved in fostering an information rich environment in which learners can explore their personal interests (n=269 or 91%); employing effective collection management practices for digital resources (n=224 or 76%); and ensuring connections to a wide variety of digital resources within and beyond school walls (n=213 or 72%).

Respondents were much less often fully or substantially involved in applying evaluative criteria to select digital resources (n=189 or 64%); collaborating with the school community to assess the needs for digital resources (n=187 or 63%); and, as Figure 3 shows, following a consistent procedure for assessing the effectiveness of digital resources (n=164 or 56%).
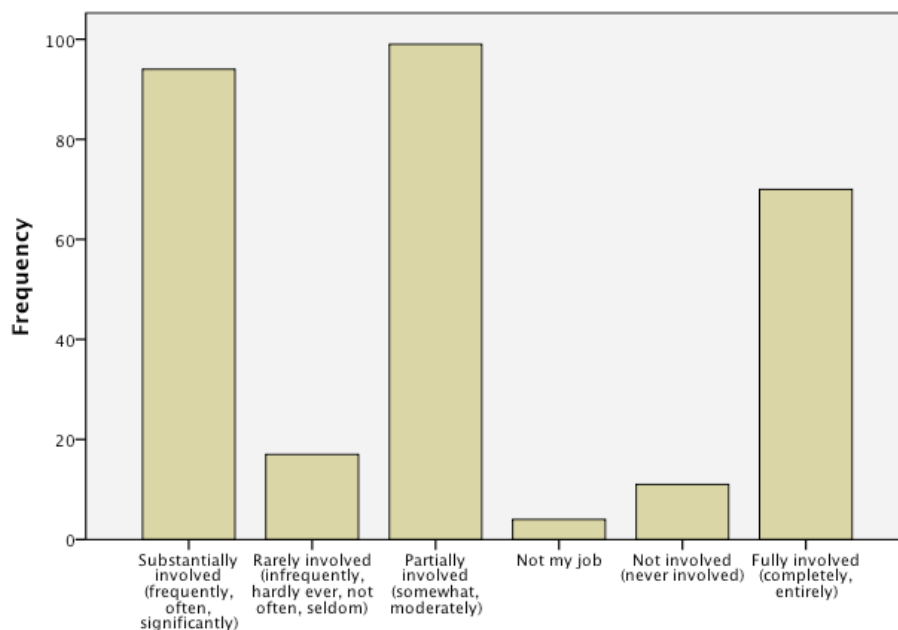
Figure 3. Survey participants' responses to "I follow a consistent procedure to assess the effectiveness of digital resources" (N=295).

Section V. What library medias specialists do: Leading innovation through the library media program
This standard calls for teacher librarians to "lead in providing equitable access to and effective use of technologies and innovations" (NBPTS, 2001, p.23). Questions in this survey section pertained to providing access to technology information systems; teaching effective use of technology and other resources; engaging learners with technology; and enhancing learning.

The majority of respondents were fully or substantially involved in many areas measured by the questions in this section. Respondents possessed the knowledge and confidence to act as technology leaders (n=253 or 86%); maximized access to technology for the learning community (n=249 or 84%); strived to reduce barriers to the constructive use of digital resources (n=228 or 77%); and contributed to committees that raised awareness of technology (n=223 or 76%); led the delivery of information beyond school walls (n=213 or 72%); and managed school library websites (n=209 or 71%);

However, fewer respondents were fully or substantially involved in providing technology training integral to the school's professional development plan (n=158 or 54%); seeking funding for technology or digital resources (n=152 or 53%); participating in the technology decision-making process in the school district (n=114 or 38%); and, as Figure 4 shows, forging partnerships in the community to increase technology and digital resource offerings (n=84 or 29%).
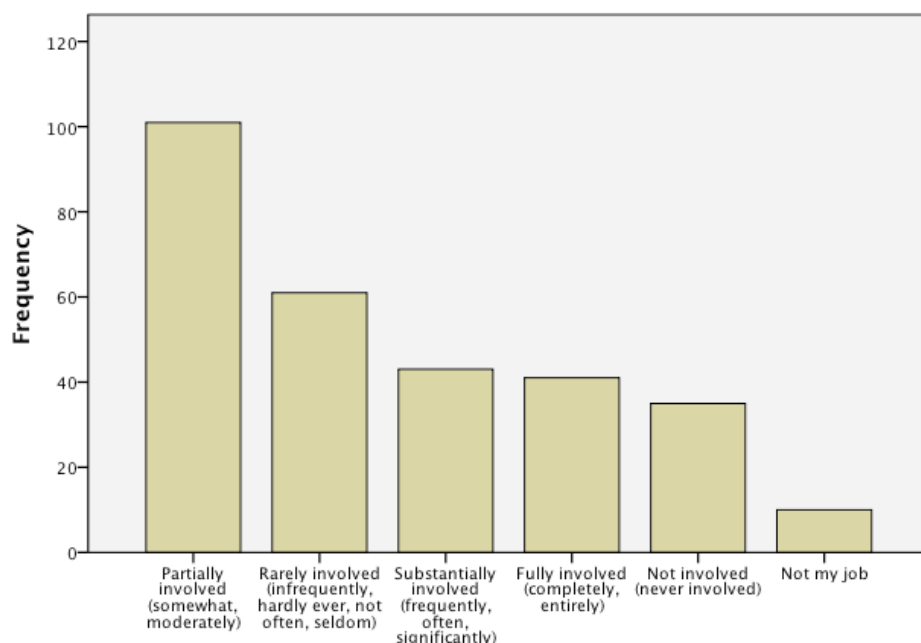
Figure 4. Survey participants' responses to "I make partnerships throughout the community to increase digital resources and technologies offered to learners" (N=291).

Section VI. What library media specialists do: Administering the library media program
In this section, questions centred on participants' abilities to "plan, develop, implement, manage, and evaluate library media programs to ensure that students and staff use ideas and information effectively" (NBPTS, 2001, p.27). Questions addressed planning, developing, implementing, managing, and evaluating the library media program.

Most survey respondents were fully or substantially involved in using the reporting options of library management systems (n=282 or 96%) and ensuring that the school library's mission evolved in step with technological change (n=281 or 95%). Far fewer survey participants were fully or substantially involved in organizing special programs and events related to technology (n=180 or 61%) and maintaining technological equipment (n=166 or 56%).

Section VII. How library media specialists grow as professionals: Reflective practice
In this section, questions solicited the extent to which teacher librarians were able to "engage in reflective practice to increase their effectiveness" (NBPTS, 2001, p. 31) through questions that pertained to both self-reflection and reflecting on the library media program.

Many respondents fully or substantially participated in the reflective process by reflecting on student assessments to modify instruction (n=228 or 77%) and by soliciting feedback from teachers (n=207 or 70%) and students (n=203 or 66%) about the use of technology in the school library.

Section VIII. How library media specialists grow as professionals: Professional growth
According to the NBPTS (2001), strong teacher librarians "model a strong commitment to lifelong learning and to their profession" (p.35). To measure this commitment, questions in this section focused on furthering professional education and networking opportunities.

This section captured many ways in which teacher librarians ensured their continued growth by staying abreast of innovations by reading professional materials (n=240 or 81%); belonging to professional

organizations (n=235 or 80%); and engaging in face-to-face and online professional development (n=233 or 79%). However, as Figure 5 shows, teacher librarian leaders are much less likely to be fully or substantially involved in sharing their technology knowledge in the learning community (n=163 or 55%) or by presenting at conferences (n=114 or 39%).
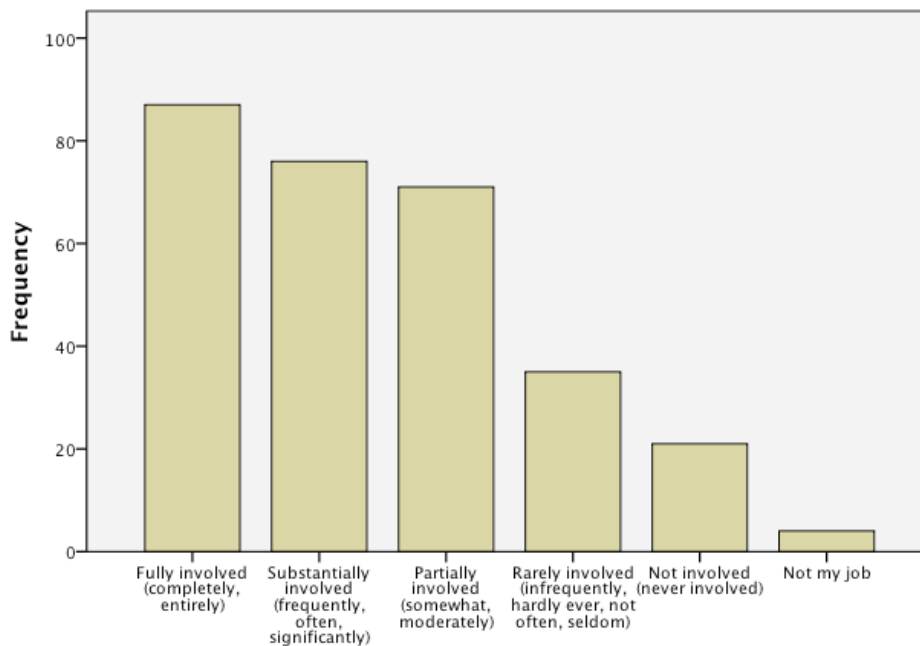

Figure 5. Survey participants' responses to "I present technology-related professional development activities at conferences" (N=292).

Section IX. How library media specialists grow as professionals: Ethics, equity, and diversity
This section centred on the abilities of the teacher librarian to "uphold professional ethics and promote equity and diversity" (p.39) through questions about the ethical use of information and promoting equity and diversity.

The majority of respondents were fully or substantially aware of technology and digital resource use policies (n=273 or 94%), though many fewer gave considerable input into those policies (n=167 or 57%). Many were highly involved in instructing students (n=263 or 89%) and teachers (n=230 or 78%) on the content of these policies despite the fact that an overwhelming majority of survey participants (n=289 or 98%) modelled adherence to the policies including cultivating an understanding of Creative Commons and Fair Use (n=225 or 76%).

Most teacher librarians fully or substantially empowered learners from diverse backgrounds with technology (n=261 or 89%); ensured that their digital collections reflected cultural diversity (n=237 or 80%); and were informed about cloud-based and open source software options to promote economic equity (n=208 or 71%).

Section X. How library media specialists grow as professionals: Leadership, advocacy, and community partnerships
The final NBPTS standard calls for teacher librarians to "advocate for the library media program, involving the greater community" (p.43). To reflect this standard, the survey contained questions about leadership, advocacy, and community partnerships.

This section reflected many fewer teacher librarians achieving full or substantial involvement in disseminating information about technology use in the school (n=181 or 61%) and about advances in

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technology (n=159 or 53%) to the community and few were fully or substantially involved in advocating for the use of technology in schools (n=106 or 35%), as Figure 6 shows.
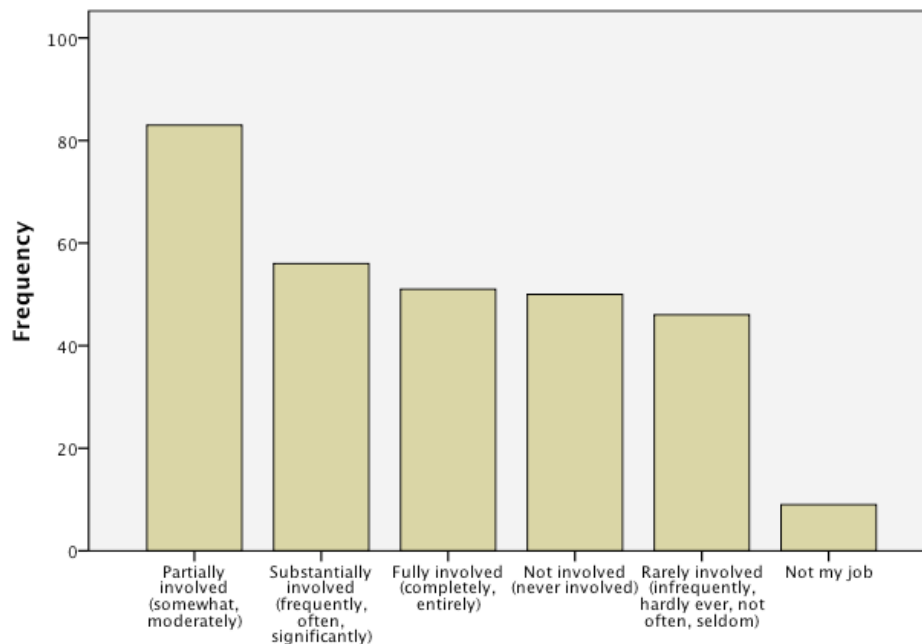

Figure 6. Participants' responses to "I advocate on local, state, and/or national levels for the implementation of technology in education" (N=295).

Also, to a lesser extent, teacher librarians were fully or substantially involved in developing strategies and in using technology to inspire students to make a contribution to the community at large (n=132 or 44%) and were aware of information about advances in technology and digital resources (n=160 or 54%).

Conclusions and Implications
This survey represented the perspectives of experienced teacher librarian leaders and educators working in technology-rich environments in which they balanced the demands of a flexible schedule with the often-sole responsibility for a large number of desktop and laptop computers, professional development, and promotion of the use of a range of resources in teaching and learning.

Prior research on technology integration and leadership activities of teacher librarians has demonstrated that while professional guidelines and theory promote these roles as possible and preferable, they are not often realized due to a number of personal, school-based, and external factors. The preliminary survey results presented in this paper suggest that teacher librarians felt strong commitments to and experienced success with technology leadership with students to a great extent and with teachers to a lesser, but not insignificant, extent. However, when teacher librarians were asked to report their technology leadership outside of their school buildings, they reported much lower levels of involvement in district-wide policymaking and information sharing activities as well as in dissemination to peers at conferences and community members.

Despite their strong self-identities as professionals capable of leading technology integration, these initial survey findings are consistent with Formative Leadership Theory in that teacher librarians experience the greatest leadership potential in their school environments, but are can often be unsuccessful in their transfer of technology leadership activities to their professional or local communities. These preliminary results suggest that further research to explore the interplay between technology leadership in the school building, and advocacy for technology and school libraries in the community could reveal positive effects on student learning.

There are three key areas in which teacher librarians seem to have unrealized leadership potential:
- Participating in technology-based assessment and services to enhance opportunities for all learners, especially those with special needs;
- Developing processes to systematically collect, manage, and assess the effectiveness of digital resources;
- Sharing their knowledge and advocating for technology to with the profession and in the community.

Statement of Originality
This statement certifies that the paper above is based upon original research undertaken by the author and that the paper was conceived and written by the author(s) alone and has not been published elsewhere. All information and ideas from others is referenced.

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Appendix. Project Leadership-in-Action (LIA) Survey Questions

School Name: _____

 Your age in years: _____   Your gender _____

Your ethnicity: Hispanic or Latino   American Indian or Alaska Native   Asian   Native Hawaiian or Other Pacific Islander

                              White   More than one race

Certification/Position:
___ Teacher-Librarian (state certified as both teacher and librarian/media specialist)
___ Teacher (state certified as a teacher, but not as a librarian/media specialist)
___ Librarian (State certified librarian/media specialist, or with a master's degree in library and information science, but not
                    certified as a teacher)
___ Other (certified as neither a teacher nor a librarian/media specialist, without a masters degree in library and information
                    science)

State where you were certified: _____

Years experience as a school library media specialist _____

Do you have experience as a classroom teacher? Y   N

If yes, what level and/or subject did you teach?
(drop down menus) Level: Elementary, Middle, High
Elem choose grade level: K, 1, 2, 3, 4, 5
Middle or High choose subject area: language arts, science, math…

How many schools do you serve? ____

Are you full-time or part-time? _____

How many certified full-time school library media specialists work in your school? Please include yourself in the count if you are full-time. _____

How many certified part-time school library media specialist work in your school? Please include yourself if you are part-time. _____

Are there other paid staff working in your library who are not a certified school library media specialists (e.g., clerk, aide, paraprofessional)? Y   N

If yes, how many are full-time? _____   How many are part-time? _____

How many hours a week do you have library volunteer help? _____
(total hours=number of volunteers x number of hours each work: example 6 volunteers working 15 hours each per week is 90 hours of volunteer help.)

Do you have a full-time instructional technology person in your school? Y   N

Do you have a part-time instructional technology person in your school? Y   N

Type of schedule (choose one): fixed   flexible   combination of fixed and flexible   block

What type of Internet access exists in your library? None   Dialup   Broadband   Don't know

If there is Internet access in your library, does it have filtered or unfiltered access for:
(Drop down here with choices for students and another one for professional staff): filtered only, unfiltered only, both filtered and unfiltered, Don't know)
_____ students
_____ Professional staff (e.g., school library media specialist, classroom teachers)

Do you have wireless access to the Internet in your school? Y   N   Don't know

Number of computers for use in the library media center: Desktops: _____   Laptops: _____

Scale:
Not involved (never involved)
Rarely involved (infrequently, hardly ever, not often, seldom)
Partially involved (somewhat, moderately, sometimes)
Substantially involved (frequently, often, most of the time, significantly)
Fully involved (completely, entirely)

I. Knowledge of Learners	Level of Statement
1. I provide learners with technological tools to meet their needs.	Entry
2. I instruct learners in using the most appropriate technology to meet their needs.	Adaptive
3. I impact school-wide decision-making concerning technology and learning.	Transformative
4. I provide assistive and adaptive technologies for learners.	Entry

SLMS Personal Practice of …Knowledge of Teaching and Learning	Level of Statement
5. I use technology to differentiate my instruction.	Adaptation
6. I understand that appropriate use of technology can pique learners' interest.	Entry
7. My instruction integrates technology that is aligned to local, state and/or national professional and technology standards.	Transformative
8. In my instruction I model use of emerging technologies.	Adaptive
9. I teach learners how to identify the appropriate technology for their needs.	Adaptive

Integrating Instruction	Level of Statement
10. I collaborate with teachers to plan for using technology in their instruction.	Adaptive
11. I provide teachers with access to technology that enhances their instruction.	Entry
12. I provide teachers with a range of technological alternatives for assessing students learning.	Adaptive
13. I advocate for the use of technology for alternative demonstrations of student learning.	Transformative
14. I am involved in the initial process of setting learning objectives and	Transformative

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promoting the integration of technology in classroom instruction.	
15. I promote learning activities that connect the use of technology to content standards.	Transformative
16. I help learners create their products using various types of technology.	Entry
17. I facilitate learners' use of technology to create products that express new ideas.	Adaptive

Knowledge of Library and information Studies (Resource Focus)	Level of Statement
18. I apply evaluative criteria to select digital resources for acquisition.	Entry
19. I collaborate with the school learning community to assess curricular needs for digital resources and incorporate this information when considering immediate and long-range budgets.	Adaptive
20. I foster an information rich environment where learners can explore their personal interests.	Transformative
21. I follow a consistent procedure to assess the effectiveness of digital resources.	Adaptive
22. I ensure connections to a wide variety of digital resources within and beyond the school walls.	Entry
23. I employ effective management skills in collecting, organizing, disseminating, and maintaining digital resources in order to enhance access.	Adaptive

Leading Innovation through Library Media Program	Level of Statement
24. I possess the knowledge, confidence and courage to act as a technology leader.	Transformative
25. I maximize access to technology equipment for all members of the learning community.	Adaptive
26. I manage a school library website.	Adaptive
27. I take the lead in the delivery of information beyond the school walls.	Transformative
28. I seek grants and funding opportunities to provide technology and/or digital resources to the school community.	Transformative
29. I strive to reduce barriers to constructive use of digital resources.	Transformative
30. The technology training I provide to teachers is an integral part of my school's professional development plan.	Transformative
31. I actively contribute to school committees or teams to make the learning community aware of the availability of technologies and how best to use them.	Transformative
32. I participate in the educational technology decision-making process in my district.	Transformative
33. I make partnerships throughout the community to increase digital resources and technologies offered to learners.	Adaptive

Administering the Library Media Program	Level of Statement
34. I choose technology tools appropriate for administrative tasks.	Entry
35. I use the reporting options of library management systems (e.g., circulation systems, reading programs, collection analysis).	Transformative
36. I ensure that the school library media center's mission continues to evolve as technology changes.	Adaptive
37. I organize special programs and events related to technology.	Adaptive
38. I maintain technology equipment.	Entry

Reflective Practice	Level of Statement

39. I solicit feedback from teachers about technology.	Transformative
40. I solicit feedback from students about technology.	Transformative
41. I reflect on and learn from student assessments and modify instruction as necessary.	Transformative

Professional Growth	Level of Statement
42. I stay abreast of innovations in technology through reading professional materials in both print and online.	Entry
43. I belong to professional organizations that promote the use of technology in education.	Adaptive
44. I present technology related professional development activities at conferences.	Transformative
45. I present technology related professional development activities to the learning community.	Adaptive
46. I engage in face-to-face and/or online professional interactions with peers and experts.	Adaptive

Ethics, Equity, and Diversity	Level of Statement
47. I am aware of policies on the use of technology and digital resources.	Entry
48. I provide input on policies on the use of technology and digital resources.	Adaptive
49. I provide instruction for teachers on the ethical and legal policies and practices relating to technology and digital resources.	Adaptive
50. I provide instruction for students on the ethical and legal policies and practices relating to technology and digital resources.	Adaptive
51. I model the ethical and legal policies and practices relating to technology and digital resources.	Adaptive
52. I ensure that digital resources reflect the diversity of cultural expression.	Adaptive
53. I use technology to enable and empower learners with diverse backgrounds.	Adaptive
54. I understand the new developments in Fair Use and Creative Commons and share that knowledge with learners using and producing media	Adaptive
55. I examine web-based and free or open-source software alternatives to promote equity.	Transformational

Leadership, Advocacy, and Community Partnerships	Level of Statement
56. I disseminate information about the use of technology and digital resources within the school to the community at large.	Adaptive
57. I disseminate information about advances in educational technology and digital resources to the community at large.	Adaptive
58. I advocate on local, state and/or national levels for the implementation of technology in education.	Transformative
59. I develop strategies and use technology to inspire students to make a contribution to the community at large.	Transformational
60. I am aware of information about advances in technology and digital resources.	Entry